

# SNS COLLEGE OF TECHNOLOGY AN AUTONOMOUS INSTITUTION



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#### DEPARTMENT OF FOOD TECHNOLOGY

COURSE CODE & NAME: 19FTT301 & Refrigeration & Cold Chain Management

III YEAR / V SEMESTER

**UNIT: I INTRODUCTION TO REFRIGERATION** 

**TOPIC 1: Ozone Depletion Potential** 



### **Ozone Depletion Potential (ODP)**



- ➤ Ozone Depletion Potential, is the potential for a single molecule of the refrigerant to destroy the Ozone Layer. All of the refrigerants use R11 as a calibration and thus R11 has an ODP of 1.
- The *less the value of the* ODP the better the refrigerant is for the Ozone Layer and the Environment.

➤ Ozone Depletion Potential (ODP) of a chemical compound is the relative amount of degradation it can cause to the ozone layer

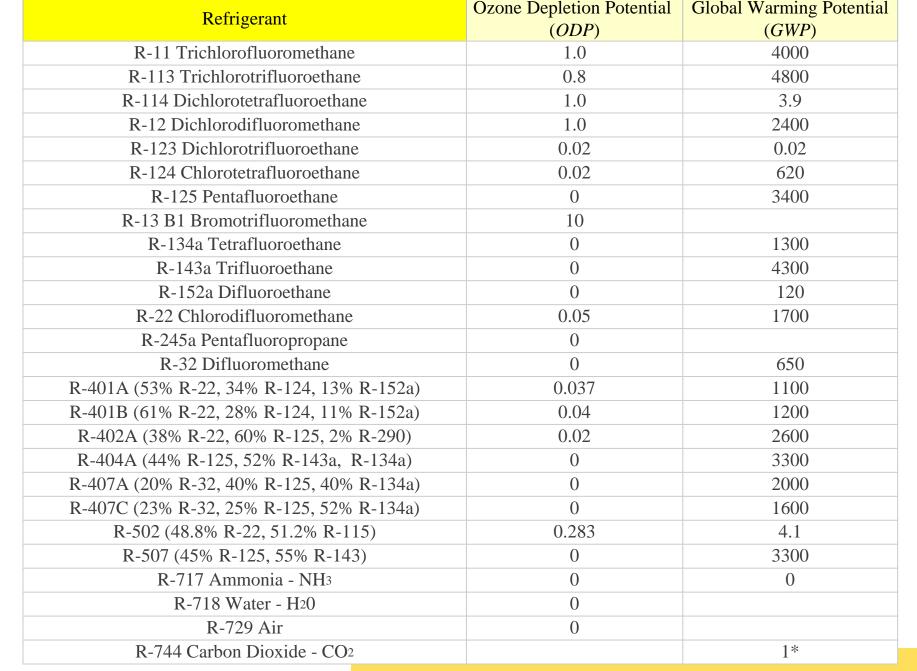


## **Ozone Depletion Potential**



- ➤ Ozone is an isotope of oxygen with three atoms instead of normal two. It is naturally occurring gas which is created by high energy radiation from the Sun.
- The greatest concentration of ozone are found from 12 km to 50 km above the earth forming a layer in the stratosphere which is called the ozone layer.
- This layer, which forms a semi-permeable blanket, protects the earth by reducing the intensity of harmful ultra-violet (UV) radiation from the sun.









### **Ozone Depletion Potential**



#### Harmful consequences of ozone depletion

- For Humans Increase in skin cancer snow blindness cataracts
- Less immunity to infectious diseases malaria
- For plants smaller size lower yield increased toxicity altered form
- For marine life Reduced plankton juvenile fish larval crabs and shrimps





#### **Important Refrigerants:**

Properties at -15°C

- (1) Ammonia (NH<sub>3</sub>)(R-717)

  Latent heat = 1312.75 kJ/Kg

  Specific volume = 0.509 m<sup>3</sup>/kg
- (2) Dichloro-Difluoro methane (Freon-12) (R-12) [C Cl<sub>2</sub> F<sub>2</sub>]

  Latent heat = 162 kJ/Kg

  Specific volume = 0.093 m<sup>3</sup>/kg
- (3) Difluoro monochloro methane or Freon-22 (R-22) [CH Cl F<sub>2</sub>]

  Latent heat = 131 kJ/Kg

  Specific Volume = 0.15 m<sup>3</sup>/kg.



# **Global Warming Potential**



➤ Global Warming Potential, is a measurement of how much effect the given refrigerant will have on Global Warming in relation to Carbon Dioxide. This is usually measured over a one hundred year period. In this case the *lower the value of GWP* the better the refrigerant is for the environment.

➤ **GWP** is a relative scale which compares the amount of heat trapped by greenhouse gas to the amount of heat trapped in the same mass of Carbon Dioxide.





